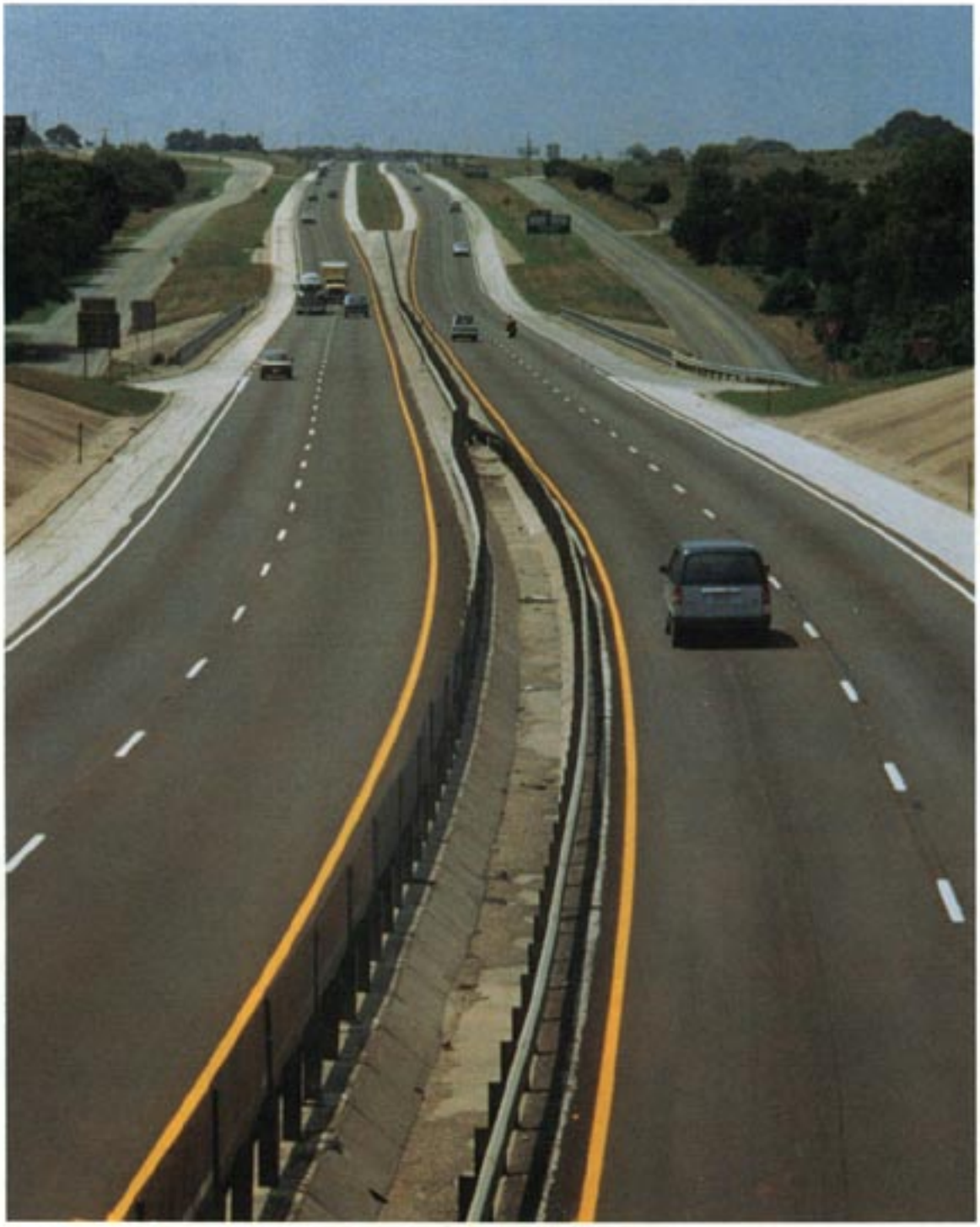
Micro-Surfacing



Pavement Resurfacing

Introduction to Micro-Surfacing

Highway A-6, Madrid - Adanero, Spain

What is Micro-Surfacing?

One of the most versatile tools in the road maintenance arsenal, Micro-Surfacing is a polymer modified cold-mix paving system that can remedy a broad range of problems on today's streets, highways, and airfields.

Like its parent product, slurry seal, Micro-Surfacing begins as a mixture of dense-graded aggregate, asphalt emulsion, water, and mineral fillers. While conventional slurry seal is used around the world as an economical treatment for sealing and extending the service life of both urban and rural roads, Micro-surfacing has many added capabilities, thanks to the use of high-quality, carefully monitored materials, including advanced polymers and other modern additives.

Downtown Birmingham, Alabama, USA

Surfacing in Denmark

A History of Expanding Service

Micro-Surfacing was pioneered in Germany in the late 1960's and early 1970's. German scientists began experimenting with conventional slurry to find a way to use it in thicker applications which could be applied in narrow courses for wheel ruts — and not destroy the expensive road striping lines on the autobahns.

Working on a German Autobahn

When the scientists used highly selected aggregates and bitumen, and then incorporated special polymers and emulsifiers that allowed the product to remain stable even when applied in multi-stone thicknesses, the result was Micro-Surfacing.

Showing wheel rut depth

Introduced in the United States in 1980, Micro-Surfacing now is recognized not only as the most cost-effective way to treat the surface wheel-rutting problem, but also a variety of other road surface problems. Micro-Surfacing is now used throughout Europe, the United States, and Australia, and is making inroads into many other areas.

How Is Micro-Surfacing Made and Applied?

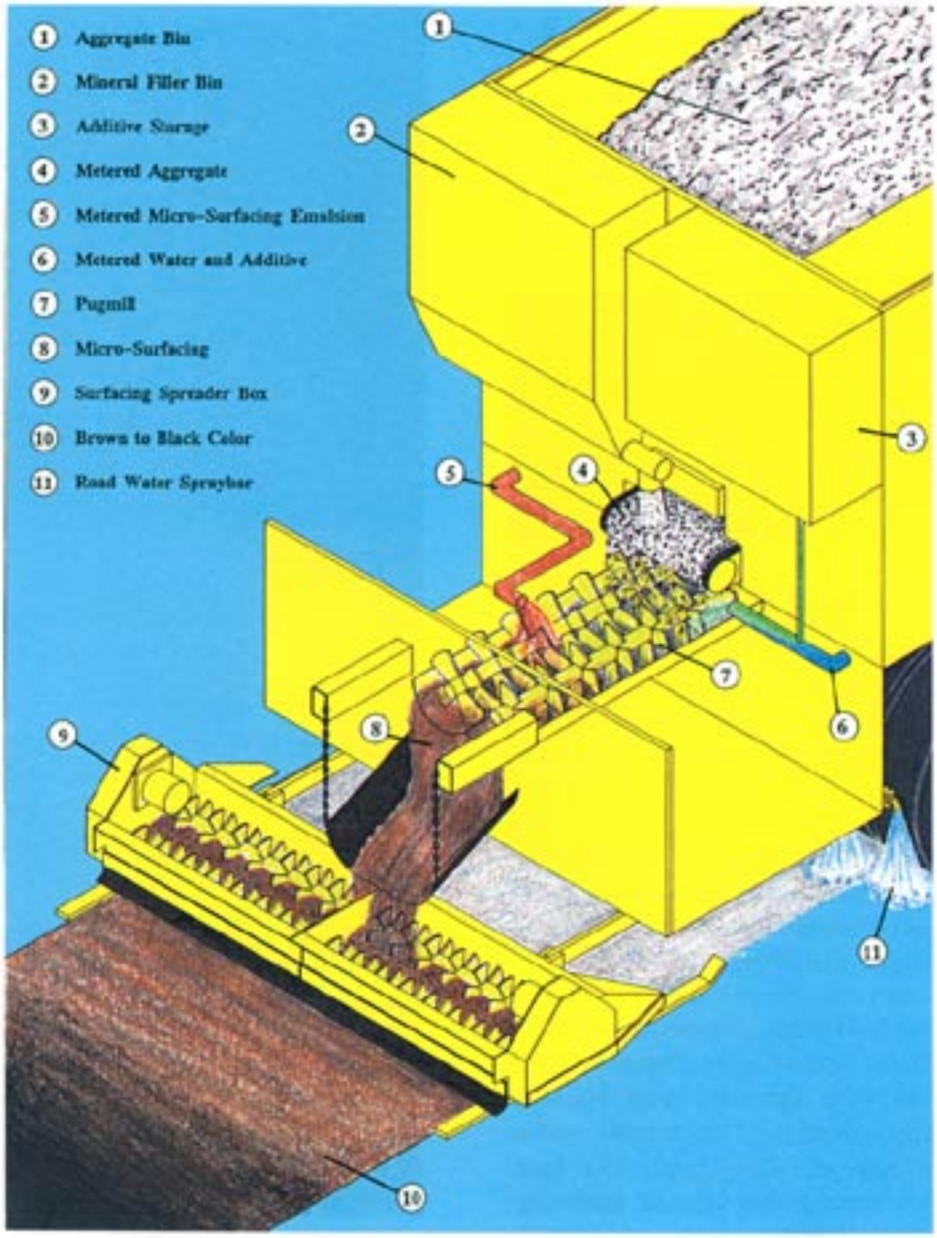
Micro-Surfacing is made and applied to existing pavements by a specialized machine, which carries all components, mixes them on site, and spreads the mixture onto the road surface.

Materials are continuously and accurately measured, and then thoroughly combined in the Micro-Surfacing machine's mixer.

Continuous load — continuous run operation

As the machine moves forward, the mixture is continuously fed into a full-width "surfacing" box which spreads the Micro-Surfacing across the width of a traffic lane in a single pass. Or specially engineered "rut" boxes, designed to deliver the largest aggregate particles into the deepest part of the rut to give maximum stability in the wheel path, may be used. Edges of the Micro-Surfacing are automatically feathered.

The new surface is initially a dark brown color and changes to the finished black surface as the water is chemically ejected and the surface cures, permitting traffic within one hour, in most cases.



The Micro-Surfacing Process

Continuous-load pavers utilize support units which bring the materials to the job site and load the machine while it is working, thus maximizing production and minimizing transverse joints.

Application of Micro-Surfacing using rut filling box

Fresh material on left, cured on right

A Proven Problem Solver

Using various design mixes, techniques, and equipment, Micro-Surfacing can be used successfully in these situations:

Top Layer, shows surface texture of Micro-Surfacing

• In quick-traffic applications as thin as 3/8 inch (9.5mm), Micro-Surfacing can increase skid resistance, color contrast, surface restoration, and service life to high-speed, heavy-traffic roadways (Interstates, and Autobahns). Such projects are often reopened to traffic within an hour.

• Modern, continuous-load pavers can lay 500 tons of Micro-Surfacing per day, with no long traffic delays. This equates to an average 6.6 lane miles (10.6 lane kilometers) per day for surfacing applications.

Addison, Texas, USA, airport

• On airfields, dense-graded Micro-Surfacing produces a skid resistant surface without loose rock that damages aircraft engines.

• As a thin, restorative surface course on urban arterials and heavy traffic intersections, Micro-Surfacing does not alter drainage; there's no loss of curb reveal.

U.S. Highway 84, Texas, USA

• Micro-Surfacing is applied to problem sections of roads or runways to eliminate hydroplaning problems that occur during periods of rain. The Micro-Surfacing restores the proper surface profile and makes the area safe for use.

Surfacing in California, USA

• Because Micro-Surfacing can be effectively applied to most surfaces at 3/8 inches (9.5mm) or less, more area per ton of mix is covered, resulting in cost-effective resurfacing.

• Micro-Surfacing creates a new, stable surface that is resistant to rutting and shoving in summer and to cracking in winter.

• Applied to both asphalt and Portland cement concrete surfaces (usually preceded by a tack coat on concrete), Micro-Surfacing is often used to restore a skid resistant surface to slick bridge decking with minimum added dead weight.

• Used as a scratch (leveling) course, to be followed by a surface course, Micro-Surfacing can provide transverse surface leveling.

• Because of its quick-traffic properties, Micro-Surfacing can be applied in a broad range of temperatures and weather conditions, effectively lengthening the paving season. It is particularly suitable for night applications on heavy-traffic streets, highways, and airfields.

Night work, Interstate 270, Ohio, USA

• Applied at ambient temperature, Micro-Surfacing has low energy requirements. And it is environmentally safe, emitting no pollutants.

• Micro-Surfacing's life expectancy usually exceeds seven years.

• Capable of filling wheel ruts up to 1 1/2 inches (38mm) deep when the pavement has stablized and is not subject to plastic deformation, Micro-Surfacing has the unique ability to solve this problem without milling.

State Highway, Central Texas, USA, 30,000 ADT, 15% truck traffic

1. Rut before application

2. Filling the rut

3. The finished pass

4. Showing filled rut

5. One year later, both ruts filled

A Product of Quality

Successful Micro-Surfacing incorporates carefully selected materials, scientific mix designs, advanced technical specifications, and proven field practices.

Micro-Surfacing begins with the selection of high-quality materials — asphalt, aggregate, emulsifiers, water, and additives — which must pass special laboratory tests, both individually and when combined as a Micro-Surfacing system.

The Schultz-Breuer-Ruck Test

The International Slurry Surfacing Association's (ISSA) broad range of specialized mix design tests help to insure that the mixture has these Micro-Surfacing characteristics:

1. Is capable of being spread in variable thick cross sections(wedges, ruts, scratches course), which...

2. After initial traffic consolidation, it does not further compact (i.e., resists compaction) throughout the entire design tolerance range of bitumen content and variable thicknesses to be encountered and...

3. Maintain good macro-texture (high wet coefficient of friction) in variable thick sections throughout the service life of the Micro-Surfacing.

The Loaded Wheel Tester, ISSA TB-109

Successful Micro-Surfacing projects depend on strict adherence to technical specifications. Many users find it helpful to design their individual job specifications around those recommended by the ISSA (Technical Bulletin A-143).

The resulting "mix design" and job specifications are carefully adhered to in the field, where ISSA member contractors use specialized job-calibrated equipment and thoroughly trained crews to maintain consistent quality control.

Filling ruts on German Autobahn A7

Core sampling a filled wheel rut

Here's What Road Authorties Are Saying About Micro-Surfacing

"Micro-Surfacing fills a gap that heretofore existed between chip seals and hot-mix overlays. We've been rut-filling, then going over that with a full-width Micro-Surfacing overlay. We're looking...at five to six years' minimum life."

Kirby Pickett,
Texas State District 9 Engineer
USA

"We use the Micro-Surfacing to improve skid resistance. We know from experience it will improve skid numbers into the 40's...It's an integral part of our secondary maintenance program."

Jack Leigh
Virginia State Maintenance Engineer
USA

"Micro-Surfacing has become a standard specification for both re-profiling and reseal over-lays in the City of Johannesburg."

Dave Read, City Engineer
Johannesburg, South Africa

"Micro-Surfacing is an excellent technique for road maintenance and an important contribution to traffic safety."

Ing. Sandro Rocci
Director of Road Technology
Ministry of Public Works, Spain

"Our experience to date clearly indicates that Micro-Surfacing has much to offer in applications such as rut-filling, treatment of raveling, ... and reduction of noise levels... in urban areas."

Dr. Ron Gordon
Pavement Engineer
Queensland DOT, Australia

"Thirteen years' experience has convinced us that Micro-Surfacing is a high quality, technically advanced process of virtually universal application in the maintenance and optimization of road surfaces. Decisive features are its fine cost-benefit ratio, ecological compatibility and contribution to road safety through consistently good grip, good surface drainage, and considerable sound absorption properties."

Autobahnamt Montabaur,
Rheinland Pfalz, Germany

Micro-Surfacing In Action

Surfacing Interstate 40, Texas, USA

A Virginia, USA highway safety problem is solved.

The Quick-Traffic feature of the Micro-Surfacing is demonstrated.

Bruce Highway, Queensland, Australia

Filled wheel ruts in Wyoming, USA

City Street South West London, UK

Highway A68, Bilbao-San Sebastian, Spain

Alicante, Spain airport

Nanterre Bridge, Paris, France

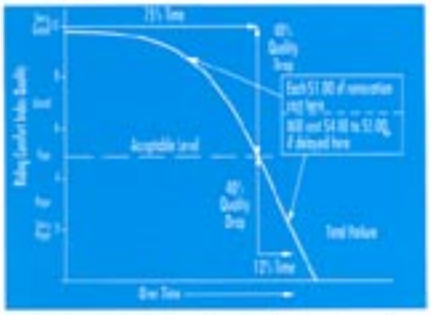
Surfacing Interstate 75, Ohio, USA

Slurry Systems — Quality Pavement Insurance

Even the best of surfaces are subject to the wear and tear caused by time, weather and traffic. No surface is permanent.

By undertaking a program of planned pavement maintenance, major savings in rehabilitation costs may be achieved, as shown in the graph below.

The application of the proper asphalt slurry system (Micro-Surfacing and/or slurry seal) will significantly extend the life of existing pavements by protecting the undersurface from damage caused by water seepage and oxidation. Improved surface performance is also achieved.



A pavement maintenance program using slurry systems will not only help to protect your pavement — it will help to protect your paving investment.

When you put your pavement maintenance needs in the professional hands of an International Slurry Surfacing Association (ISSA) member, you are assured of receiving the very best *pavement insurance.*

Contact the ISSA for further information and guide specifications on using Micro-Surfacing and slurry seal as a part of your pavement maintenance program and for the name of the ISSA member contractor nearest you.

This publication is produced and distributed worldwide by the International Slurry Surfacing Association (ISSA). ISSA is an international non-profit organization composed of individuals, corporations, and government agencies who provide the industry with machinery , materials, and services. The objectives of the ISSA include:

- Provide technical data for monitoring and upgrading asphalt slurry systems (slurry seal and Micro-Surfacing) products;
- Advocate and encourage public and private interest in the use of asphalt slurry systems as efficient, effective, cost-saving, and safe additions to road maintenance programs;
- Encourage and promote ethical quality construction practices by all members of this association within the industry; and
- Aid all members of the association in furthering the success of asphalt slurry systems.

International Slurry Surfacing Association

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